

DIVISION 2 – EARTHWORK

| | |
|--|------|
| Section 201. Clearing | 2-1 |
| Section 202. Removing Trees, Stumps, and Corduroy..... | 2-5 |
| Section 203. Removing Drainage Structures, Culverts, and Sewers..... | 2-7 |
| Section 204. Removing Miscellaneous Structures and Materials | 2-10 |
| Section 205. Roadway Earthwork | 2-16 |
| Section 206. Excavation and Backfill for Structures | 2-34 |
| Section 207. Obliterating Roadway | 2-38 |
| Section 208. Soil Erosion and Sedimentation Control | 2-40 |
| Section 209. Project Cleanup | 2-48 |

NOTES

Section 201. Clearing

201.01. Description

This work consists of clearing, selectively thinning, clearing for fence, and applying growth preventive material if required.

201.02. Materials

Provide materials in accordance with the following section:

Growth Preventive Material.....917

The Michigan Department of Agriculture and Rural Development must certify the applicator that is used to apply growth preventive material. Provide certification to the Engineer prior to the application.

201.03. Construction

- A. **Clearing.** Cut, remove, and dispose of trees, stumps, brush, shrubs, roots, logs, and other vegetation. Salvage marketable timber. Preserve vegetation and objects that are required to remain from injury or defacement.
 1. **Removals.** Remove trees, stumps, and other vegetation to 10 feet outside the limits of earth disturbance or to the right-of-way line, whichever is less. In other areas, remove trees, stumps, and other vegetation as shown on the plans. Remove trees without endangering traffic and the general public, injuring other trees, and damaging structures or property.

In peat treatment areas, remove trees, stumps, and other vegetation to the outer limits of the peat excavation. Between outer peat excavation limits and outer clearing limits, cut off vegetation to no greater than 6 inches above the ground. Removal of stumps and roots beyond the peat excavation limits is not required. If the Engineer approves, bury stumps with at least 2 feet of cover in peat disposal areas outside the limits of sound fill.
 2. **Protecting Plant Life.** Protect vegetation that is not designated for removal on the plans or by the Engineer. Repair or replace trees or shrubs damaged by Contractor operations at no additional cost to the Department.
 3. **Salvaging Marketable Timber.** Do not burn or waste marketable timber. Marketable timber includes trees with a diameter of at least 6 inches measured 4½ feet above the base of the tree at the ground line. Timber does not need to be cut in lengths of less than 8 feet.

Salvage marketable timber in accordance with the following:

- a. **Right-of-Way Purchased in Fee Simple.** On right-of-way purchased in fee simple, the Department considers marketable timber the property of the Contractor. Make marketable timber available to wood-using industries or individuals.
- b. **Right-of-Way Easements.** On right-of-way easements, the Department considers marketable timber the property of the landowner. Cut and neatly stack marketable timber on the landowner's property adjacent to the right-of-way.

Provide the Engineer with the property owner's written direction for the disposal of the marketable timber. Take ownership of marketable timber not wanted by the property owner and make available to wood-using industries or individuals.

On easements or special use permits on land owned by the United States Department of Agriculture (USDA) Forest Service (Forest Service) or Michigan Department of Natural Resources (MDNR), marketable timber is the property of the Forest Service or MDNR. Cut and dispose of this timber as agreed by the Department and the Forest Service or MDNR. The Forest Service or MDNR may sell or otherwise dispose of standing marketable timber to others if its removal does not unduly interfere with Contractor operations.

4. **Disposing of Unsalvageable Material.** Do not dispose of material, temporarily or permanently, in wetlands or floodplains. Dispose of unmarketable timber and vegetative debris resulting from clearing and selective thinning in accordance with subsection 205.03.P and using one of the following methods:
 - a. **Chipping.** Dispose of chips outside the right-of-way unless otherwise approved by the Engineer.
 - b. **Burning.** Obtain burning permits. Burn only trees, logs, brush, or stumps within the right-of-way in accordance with subsection 107.15.A.3. Do not use tires, heavy distillates, or plastics as kindling agents. Dispose of remaining material outside the right-of-way or in other Engineer-approved areas.
- B. **Selective Thinning.** Remove and dispose of undesirable trees, stumps, undergrowth, and debris outside areas designated for clearing. Treat stumps and stubs with a growth preventive material if required.

Protect plant life in accordance with subsection 201.03.A.2.

Dispose of materials in accordance with subsection 201.03.A.4.

The plans will show or the Engineer will direct trees and areas of undergrowth for removal by selective thinning. The Engineer will not consider this work complete until the Engineer's acceptance of the project.

Perform selective thinning in accordance with the following:

1. **Selective Thinning Type I.** Cut off stumps to no greater than 6 inches above the existing ground level and apply a growth preventive material the same day.
 2. **Selective Thinning Type II.** Chip or grind stumps to 4 inches below the proposed ground level.
- C. **Clearing for Fence.** Remove and dispose of trees, brush, stubs, stumps, and other vegetation on the fence line.

Clear no greater than 8 feet within the right-of-way. Do not clear outside the right-of-way unless approved by the Engineer. Clear less than 8 feet where possible. Access fence work locations from other public rights-of-way to avoid or reduce the removal of existing vegetation. The Contractor is responsible for obtaining and providing the Engineer with written approval from the public landowner before accessing other public rights-of-way.

Cut trees, brush, shrubs, stumps, and other vegetation flush with the ground level. Removal of roots is not required. Do not remove mature trees or bushes if trimming limbs would allow installation of the fence.

Treat stumps and stubs within 1 foot of the fence line with growth preventive material the same day.

Protect plant life in accordance with subsection 201.03.A.2.

Dispose of materials in accordance with subsection 201.03.A.4.

201.04. Measurement and Payment

| Pay Item | Pay Unit |
|--------------------------------------|----------|
| Clearing | Acre |
| Thinning, Selective, Type ____ | Acre |
| Clearing, Fence | Station |

- A. **Clearing.** The Engineer will measure **Clearing** by horizontal area bounded by the outermost trees cut. The Engineer will establish the perimeter line along the outside faces of the trunks.

The cost of clearing areas up to 10 feet outside the limits of earth disturbance, State-provided borrow areas, clear vision areas, or other

areas designated on the plans is included in the unit price for related pay items unless clearing is a separate pay item.

If the Engineer directs clearing not shown on the plans beyond 10 feet outside the limits of earth disturbance in non-State-provided borrow areas, or in clear vision areas, and the contract provides no separate pay item for **Clearing**, the Department will pay for this clearing as extra work.

If the Engineer directs the Contractor to return to perform additional clearing of areas less than ½ acre after the Engineer accepted the clearing of an area, the Department will pay for this clearing as extra work.

- B. **Thinning, Selective.** The Engineer will measure **Thinning, Selective** of the type specified by horizontal area. The unit price for **Thinning, Selective** includes the cost of providing and applying growth preventive materials, where required.
- C. **Clearing, Fence.** The Engineer will measure **Clearing, Fence** along the fence line by length. The Department will not provide additional compensation for handwork. The unit price for **Clearing, Fence** includes the cost of providing and applying growth preventive material where required.

Section 202. Removing Trees, Stumps, and Corduroy

202.01. Description

This work consists of removing trees and stumps with a diameter of at least 6 inches located outside the clearing limits and removing corduroy within the limits of the proposed roadbed and backfilling as required.

202.02. Material

Provide materials in accordance with the following:

| | |
|-----------------------------------|-----|
| Sound Earth | 205 |
| Granular Material Class III | 902 |

202.03. Construction

- A. **Removing Trees or Stumps.** Remove and dispose of trees or stumps with a diameter of at least 6 inches that are outside the clearing limits. Remove non-ornamental fruit trees within the right-of-way even if not shown on the plans. Remove and dispose of trees, stumps, roots, and debris in accordance with section 201.

If removing a stump could result in damage to existing utilities, remove the stump by chipping it to a depth of at least 12 inches below the finished ground surface. Remove other stumps by chipping only if approved by the Engineer. Backfill removal areas with granular material Class III within the influence of the subgrade surface and sound earth outside the influence of the subgrade surface.

- B. **Removing Corduroy.** Remove and dispose of logs, poles, stumps, brush, and other material embedded under the surface of an abandoned or existing road within the limits of the proposed roadbed. Remove corduroy in the roadbed if within 4 feet of the plan grade. Dispose of corduroy in accordance with section 201. Backfill trenches excavated after the removal of corduroy with granular material Class III.

202.04. Measurement and Payment

| Pay Item | Pay Unit |
|-------------------------------------|----------|
| Tree, Rem, __ inch to __ inch..... | Each |
| Stump, Rem, __ inch to __ inch..... | Each |
| Tree, Rem, 37 inch or Larger..... | Each |
| Stump, Rem, 37 inch or Larger..... | Each |
| Corduroy, Rem..... | Station |

- A. **Trees and Stumps.** The Engineer will determine the size of trees by the diameter of the trunk measured to the nearest full inch 4½ feet above the

ground line at the base of the tree. The Engineer will measure trees with major limbs lower than 4½ feet from the ground at the smallest diameter below the limbs.

The cost of removing trees or stumps with a diameter of less than 6 inches is included in other pay items.

Where more than one trunk has grown from a common stump, the Engineer will measure each trunk as a separate tree.

The Engineer will measure stump diameters to the nearest full inch at the top of the stump.

For stumps incorrectly shown on the plans as trees designated for removal, the Engineer will measure, and the Department will pay for, removing stumps with the relevant stump removal pay item. If the contract does not include stump removal pay items but includes tree removal pay items, the Department will pay for removing stumps with the relevant tree removal pay item.

The unit price for tree and stump removal pay items includes the cost of providing and placing backfill. Tree removal pay items include respective stump removal.

- B. **Corduroy, Removal.** The Engineer will measure **Corduroy, Rem** along the road centerline. The unit price for **Corduroy, Rem** includes the cost of backfill. The Department will apply **Corduroy, Rem** if below the excavation limits required for other pay items.

Section 203. Removing Drainage Structures, Culverts, and Sewers

203.01. Description

This work consists of removing or abandoning, in whole or in part, drainage structures, culverts, and sewers; salvaging, storing, and disposing of removed materials; and backfilling and compacting the excavated sites.

203.02. Materials

Provide materials in accordance with the following sections:

| | |
|-----------------------------------|-----|
| Sound Earth | 205 |
| Granular Material Class III | 902 |

203.03. Construction

- A. **Drainage Structures.** When removing or abandoning a drainage structure, rebuild and reconnect live sewers through the removal area. Maintain service of live sewers during construction operations.

If the plans show abandoning a drainage structure, remove the cover and break down the masonry in accordance with subsection 204.03. Dispose of materials in accordance with subsection 205.03.P and backfill in accordance with subsection 204.03.C.

- B. **Culvert Pipe.** Completely remove pipe culverts as required, including end treatments.

Dispose of materials in accordance with subsection 205.03.P and backfill in accordance with subsection 204.03.C.

Remove only the portions of the existing culvert pipe necessary to allow connection to the new work when extending an existing culvert or replacing the existing end treatment. Do not damage the remaining culvert pipe.

Bulkhead abandoned culvert pipes in accordance with subsection 402.03.E or use other Department-approved methods. If the Engineer determines that the culvert is not in suitable condition for abandonment, the Engineer will specify alternate treatment.

For culvert pipes with a top elevation within 5 feet of the top of pavement and that require abandonment, review the abandonment treatment with the Engineer.

- C. **Sewer Pipe.** Remove sewers (storm, sanitary, or combined) or parts of sewers that require removal or that interfere with the new construction.

Dispose of materials in accordance with subsection 205.03.P and backfill in accordance with subsection 204.03.C.

Remove only the part of the existing sewer necessary to allow the required connection to the new work when extending existing sewers or incorporating existing sewers into the new work. Trim the connecting sewer pipe edges to meet the required lines and grades without weakening or damaging those parts of the remaining sewer.

Bulkhead abandoned sewers in accordance with subsection 402.03.E or use other Department-approved methods. If the Engineer determines that the sewer pipe is not in suitable condition for abandonment, the Engineer will specify alternate treatment.

For sewer pipes with a top elevation within 5 feet of the top of pavement and that require abandonment, review the abandonment treatment with the Engineer.

203.04. Measurement and Payment

| Pay Item | Pay Unit |
|---|----------|
| Dr Structure, Rem..... | Each |
| Dr Structure, Abandon | Each |
| Culv, Rem, Less than 24 inch | Each |
| Culv, Rem, 24 inch to 48 inch | Each |
| Culv, Rem, Over 48 inch..... | Each |
| Culv, End, Rem, Less than 24 inch..... | Each |
| Culv, End, Rem, 24 inch to 48 inch..... | Each |
| Culv, End, Rem, Over 48 inch..... | Each |
| Sewer, Rem, Less than 24 inch | Foot |
| Sewer, Rem, 24 inch to 48 inch | Foot |
| Sewer, Rem, Over 48 inch..... | Foot |

- A. **General.** Unless otherwise required, the Engineer will measure structures or materials in the original positions.

The unit prices for the removal pay items include the cost of breaking down structures and material; sawing, removal, and disposal; providing, placing, and compacting backfill; and providing and placing replacement soil or base material.

The Department will pay for piling or timber cribs encountered during structure removal, but not shown on the plans, as extra work.

- B. **Drainage Structure, Removal and Drainage Structure, Abandon.** The unit prices for **Dr Structure, Rem, and Dr Structure, Abandon** include the cost of maintaining and reconnecting live sewers and of removing attached parts and connections.
- C. **Culvert, Removal and Culvert End, Removal.** The Engineer will measure elliptical or pipe arch culverts across the greatest dimension. The cost of removing existing end treatments, regardless of type, is included in the unit prices for the related culvert removal or culvert end removal pay items.
- D. **Removal of Pipes (Culverts, Sewers, Underdrains, etc.) with Diameters Less than 12 inches.** The cost of removing pipes, including culverts, sewers, and underdrains, with diameters less than 12 inches is included in the unit price for constructing the new structure, culvert, or sewer if portions of the existing pipe are within the excavation limits of a new structure, culvert, or sewer.
- E. **Abandoning Pipe Culverts and Abandoning Sewers.** The Department will not pay separately for abandoning pipe culverts and abandoning sewers.
- Unless included in the unit price for abandoning drainage structures, the Department will pay for bulkheads greater than 12 inches that are required in abandoning pipe culverts and abandoning sewers as **Sewer Bulkhead** of the type required, in accordance with subsection 402.04.D.
- F. **Removal of End Treatments.** The Department will pay for removing end treatments on existing sewers as **Culv End, Rem.**

Section 204. Removing Miscellaneous Structures and Materials

204.01. Description

This work consists of removing miscellaneous structures and materials to clear the right-of-way, salvaging or disposing of removed materials and backfilling the resulting excavated sites.

204.02. Materials

Provide materials in accordance with the following:

| | |
|-----------------------------------|-----|
| Sound Earth | 205 |
| Granular Material Class III | 902 |

204.03. Construction

A. **Breaking Down and Removing.** Remove structures or portions of structures entirely or to the limits required, including attached parts and connections. Do not damage the remaining portion of an existing structure.

1. **Partial Removal.** Break down portions of existing miscellaneous structures, not interfering with the new construction, to 3 feet below the pavement surface within the limits of the roadbed and to 1 foot below the finished grade outside the limits of the roadbed.
2. **Pavement, Curb, and Sidewalk.** Remove pavement, curb, gutter, curb and gutter, sidewalk, downspout headers, and similar structures to an existing joint or to a sawed joint. Saw concrete full depth unless otherwise approved by the Engineer. Provide for proper grades and connections to new work.

All anticipated pavement removal operations conducted over utilities and other critical areas identified on the plans must be saw cut and the pavement removed full depth in such a manner as to not disrupt or damage these utilities or critical areas. Impact- or vibratory-type equipment is not permitted.

Replace adjacent soils or base materials removed with concrete removal operations with similar material approved by the Engineer.

3. **Masonry and Concrete Structures.** Remove entirely or break down walls, foundations, and similar structures, excluding bridges, culverts, and retaining walls, in accordance with subsection 204.03.A.1.
4. **Basement Cleanout.** Remove existing backfill material from basements, break-up floors, plug drains, and backfill.

5. **Structures and Retaining Walls.** During the removal operations, protect the remaining portions of existing structures and new work under construction from damage.

If the contract requires salvaging part of a steel structure, before dismantling, match-mark with paint the members designated for re-erection. Match-mark pins, nuts, loose plates, and parts to show proper locations. Treat pins, pin holes, and machined surfaces to prevent corrosion. Wire loose parts to adjacent members or pack in match-marked containers.

If the contract requires incorporating portions of an existing concrete structure into the new construction, use a concrete saw to make the concrete cuts that will be exposed in the final work. Do not overcut corners; drill and chip to provide square corners. Avoid cutting reinforcing steel wherever possible. Do not cut off steel reinforcement projecting from the existing concrete structure. Protect projecting steel reinforcement from damage and embed it in the new concrete.

Do not use explosives unless the Engineer provides written permission in accordance with subsection 107.17. The Engineer's written permission does not relieve the Contractor of liability or responsibility for damages resulting from the use of explosives.

6. **Culvert Structures.** Remove culvert structures or parts of culvert structures required for removal or that interfere with the new construction.

For contracts requiring extension or incorporation of existing culvert structures into the new work, remove only enough of the existing structure to allow a connection to the new work. Trim the connecting edges of the existing culvert structure to the lines and grades as required without weakening or damaging that part of the structure.

7. **Railway Track Work.** Remove rails, paving, timber, rubber or concrete crossing panels, ties, track encasement, concrete header foundations, and other related items. Leave crushed stone or gravel ballast in place as directed by the Engineer.
8. **Guardrail.** Remove posts, beam elements, and anchorages, including concrete blocks and steel sleeves, or both; hardware; and other items.
9. **Utility Pole.** Remove poles, parts, and connections attached to utility poles.
10. **Fence.** Remove fence fabric, wire, posts, and foundations.
11. **Concrete Barrier and Glare Screen.** Remove concrete barrier, glare screen, and footings of an existing joint or sawed joint. Backfill as

required. Remove barrier footings and post footings entirely. Saw cut concrete full depth unless otherwise approved by the Engineer. Repair damage to existing manholes, catch basins, bridge piers, and remaining concrete barrier, glare screen, and footings that results from removal operations.

For contracts requiring extension or incorporation of existing barrier footings and/or post footings into the new work, remove only enough of the existing footing to allow a connection to the new work.

- B. **Disposal of Materials.** Assume ownership of removed materials. Without causing damage, remove materials salvaged for use by the Department, local agency, or others and store outside the construction limits in a location and manner approved by the Engineer. Dispose of materials not incorporated into the new work in accordance with subsection 205.03.P before the Department accepts the project.

The Contractor may salvage materials that meet specification requirements and use them in the new work.

Dispose of broken concrete, matted together by steel reinforcement, outside the right-of-way. Provide the Engineer with written permission from the property owner of the disposal site.

- C. **Backfilling.** Backfill excavated sites or holes resulting from removals within the influence of the subgrade surface limit with granular material Class III. Place and compact the granular material in accordance with the controlled density method in subsection 205.03.H.4.a.

For excavated sites outside the influence of the subgrade surface, backfill with sound earth in accordance with subsection 205.03.H.4.a.

204.04. Measurement and Payment

| Pay Item | Pay Unit |
|--|-----------------|
| Pavt, Rem..... | Square Yard |
| Curb, Rem | Foot |
| Gutter, Rem | Foot |
| Curb and Gutter, Rem..... | Foot |
| Sidewalk, Rem..... | Square Yard |
| Basement Cleanout | Cubic Yard |
| Track, Rem | Foot |
| Utility Pole, Rem | Each |
| Structures, Rem (Structure Identification)..... | Lump Sum |
| Structures, Rem Portions (Structure Identification)..... | Lump Sum |
| Culv, Other than Pipe, Rem | Each |
| Masonry and Conc Structure, Rem..... | Cubic Yard |

| | |
|-------------------------|------|
| Guardrail, Rem | Foot |
| Fence, Rem | Foot |
| Conc Barrier, Rem | Foot |
| Glare Screen, Rem | Foot |

- A. **General.** Unless otherwise required by the contract, the Engineer will measure the structure or material quantities in their original position.

The cost of breaking down and removing, sawing, disposing of materials, and providing, placing, and compacting backfill is included in the unit price for the related pay items. The cost of providing and placing replacement soils or base materials is included in the related pay items.

The Department will pay for piling or timber cribs encountered during the removal of structures, but not shown on the plans, as extra work.

- B. **Pavement, Removal.** The limits of **Pavt, Rem**, as shown on the plans, will be established at the discretion of the Engineer. The Engineer may decide to leave areas in place or remove additional sections to attain the required cross section and base. The Engineer will measure **Pavt, Rem** in accordance with the following criteria:

1. **HMA Pavements and HMA Driveways.** The Department will pay separately for the removal of curb, curb and gutter, or gutter in conjunction with removing hot mix asphalt (HMA) pavements or HMA driveways.
 - a. **HMA No Greater Than 12 Inches Thick.** The Engineer will measure the removal of HMA surface no greater than 12 inches thick overlying a material designated for removal or that is required to remain in place, as **HMA Surface, Rem** in accordance with subsection 501.04.H. The Engineer will measure the removal of the underlying material separately.
 - b. **HMA Greater Than 12 Inches Thick.** The Engineer will measure the removal of HMA surface, greater than 12 inches thick, overlying a material designated for removal or that is required to remain in place, as **Pavt, Rem**. The Engineer will measure the removal of the underlying material separately.
2. **Concrete and Masonry Pavements and Concrete Driveways.** The Engineer will measure the removal of concrete and masonry pavements and concrete driveways as **Pavt, Rem**.

If concrete or masonry pavements are encountered under the pavement being removed, the Engineer will measure each type of additionally encountered pavement at the unit price for **Pavt, Rem**.

The Department will consider a concrete overlay a separate pavement.

The Engineer will measure the removal of curb, curb and gutter, or gutter in conjunction with removing concrete or masonry pavement or concrete driveways, as **Pavt, Rem**.

- C. **Curb, Removal; Gutter, Removal; or Curb and Gutter, Removal.** The Engineer will measure **Curb, Rem; Gutter, Rem; and Curb and Gutter, Rem** if included as separate pay items and not removed in conjunction with pavement or driveway removal along the base of the curb face or along the flowline of the gutter.

The unit prices for **Curb, Rem; Gutter, Rem; and Curb and Gutter, Rem** include the cost of removing downspout headers.

- D. **Sidewalk, Removal.** The unit price for **Sidewalk, Rem** includes the cost of removing and disposing of sidewalk 6 inches thick or less. The Engineer will measure sidewalk greater than 6 inches thick as **Pavt, Rem** in accordance with subsection 204.04.B.
- E. **Basement Cleanout.** The Engineer will calculate the volume of **Basement Cleanout** on the elevation of the existing backfill, the elevation of the floor, and the inside dimensions of the foundation. The Engineer will measure **Basement Cleanout** outside the pay limits for **Excavation, Earth** in accordance with subsection 205.04.
- F. **Track Removal.** The Engineer will measure **Track, Rem** by the length of a single line track. The unit price for **Track, Rem** includes the cost of removing rails, ties, track encasement, stone or ballast as directed, concrete header foundations, and other related items.
- The Engineer will measure the removal of pavement from between the rails and on either side of the track as **Pavt, Rem** in accordance with subsection 204.04.B.
- G. **Utility Pole Removal.** The unit price for **Utility Pole, Rem** includes the cost of removing and disposing of the pole, attached parts, and connections.
- H. **Structures, Removal and Structures, Removal, Portions.** The unit prices for **Structures, Rem** and **Structures, Rem Portions** include the cost of removing and disposing of miscellaneous structures or portions of structures.
- I. **Payment for Culvert, Other than Pipe, Removal.** The unit price for **Culv, Other than Pipe, Rem** includes the cost of breaking down, removing, sawing, and disposing of materials and of providing, placing, and compacting backfill.

- J. **Payment for Masonry and Concrete Structures, Removal.** The Department will pay only for **Masonry and Conc Structure, Rem** if the smallest dimension of the masonry or concrete structures, or parts of masonry or concrete structures, is at least 12 inches, and the smallest dimension of reinforced concrete structures is at least 8 inches. The Department will pay for the removal of other masonry and concrete structures as **Excavation, Earth** in accordance with subsection 205.04.
- K. **Guardrail, Removal.** The Engineer will measure **Guardrail, Rem** along the face of the existing guardrail installation. The unit price for **Guardrail, Rem** includes the cost of the removal and disposal of multiple beam elements, posts, anchorages, including concrete blocks and sleeves, hardware, and other items.
- L. **Fence, Removal.** The unit price for **Fence, Rem** includes the cost of removing and disposing of fence fabric, wire, posts, and foundations.
- M. **Concrete Barrier, Removal.** The Engineer will measure **Conc Barrier, Rem** along the centerline of the barrier. The Engineer will measure the removal of split concrete barrier along the centerline of the barrier or glare screen on each side, without deductions for bridge piers. The unit price for **Conc Barrier, Rem** includes the cost of breaking down and removing, sawing, and disposing of materials; providing, placing, and compacting backfill; and repairing damage to existing items that are damaged during removal operations.
- If the pay item **Glare Screen, Rem** is not included in the contract, the cost of removing glare screen in conjunction with concrete barrier removal is included in the unit price for **Conc Barrier, Rem**.
- N. **Glare Screen, Removal.** The Engineer will measure **Glare Screen, Rem** along the centerline of the screen. The unit price for **Glare Screen, Rem** includes the cost of breaking down and removing, sawing, disposing of materials and repairing existing concrete barrier damaged during removal operations.
- O. **Bulkheads.** The cost of bulkheading abandoned pipes, conduits, or service connections with a diameter no greater than 12 inches and encountered in excavation is included in other related pay items. The Engineer will measure bulkheading abandoned pipes, conduits, or service connections with a diameter greater than 12 inches as **Sewer Bulkhead** in accordance with subsection 402.03.E.

Section 205. Roadway Earthwork

205.01. Description

This work consists of the following:

- A. Constructing earth grades by excavating soil or rock and placing embankments or fills;
- B. Salvaging and stockpiling selected materials;
- C. Providing, placing, and compacting embankment materials;
- D. Trimming the earth grade;
- E. Disposing of surplus or unsuitable material; and
- F. Maintaining the work in a finished condition until accepted by the Engineer.

Earth excavation consists of the work to excavate materials not otherwise addressed in the contract as separate work items. Rock excavation and subgrade undercutting are separate work items.

Investigate local conditions before bidding in accordance with subsection 102.04. Boring logs shown on the plans are for information only. Refer to MDOT's *Geotechnical Manual* for detailed data on soils.

G. Definitions

CIP. When used with an embankment item, CIP denotes compacted-in-place.

Frost heave textured material. Material with more than 50% silt particles by weight and a plasticity index of less than 10.

Loose measure (LM). Refer to section 109.01.B.2.

Silt. Material with a particle size from 0.002 mm to 0.075 mm.

Sound earth. Natural homogeneous material composed of soil or aggregate that can be compacted to the required density, contains no visible organic material, and has a maximum unit weight of at least 95 pounds per cubic foot.

205.02. Materials

Provide materials in accordance with the following sections:

| | |
|---------------------------------------|-----|
| Granular Material Class II, III | 902 |
| Open-Graded Aggregate..... | 902 |
| Geosynthetics | 910 |

Do not use foundry sand from metal casting for roadway earthwork.

Refer to MDOT's *Density Testing and Inspection Manual* for maximum unit weight and in-place density test methods.

205.03. Construction

Before beginning earth-disturbing activities, install soil erosion and sedimentation control measures in accordance with section 208.

The Department considers buried rubbish and trash not identified in the contract a differing site condition in accordance with subsection 103.02.C. All buried rubbish and trash that are found must be disposed of properly.

- A. **Preparing Roadway Foundation.** Remove material from the roadway foundation and salvage or dispose of. Compact the roadway foundation to the depth and density required.

Perform removal, salvage, and disposal operations in accordance with the following:

1. **Removing and Salvaging Topsoil.** Before removing topsoil, reduce vegetation to a height of 6 inches. Remove and dispose of cut vegetation, brush, rocks, and other unsuitable material.

Remove topsoil to the required depth from designated areas before excavating or placing embankment. Use equipment and methods that avoid lifting subsoil. Suspend topsoil removal if the Engineer determines that soil or weather conditions are unsuitable.

Submit a request to the Engineer in accordance with subsection 104.12 to temporarily stockpile topsoil inside the right-of-way.

Prior to temporarily stockpiling topsoil outside the right-of-way, obtain written permission from the owner of the property that has been designated for material placement and obtain required permits in accordance with subsection 208.03.A. Provide documentation to the Engineer before stockpiling topsoil. Do not stockpile temporarily or permanently in wetlands or floodplains.

Remove topsoil as follows:

- a. In peat and muck areas, do not remove topsoil;
- b. In borrow and clear vision areas, remove topsoil to the depth and width required;
- c. At inlet, outlet, and berm ditch areas, remove topsoil within the construction limits; and
- d. At roadway cut and embankment areas, remove topsoil within the limits of earth disturbance.

2. **Salvaging Materials.** Remove existing gravel, crushed stone, or selected excavated materials. The Contractor may salvage these materials. The Engineer may approve the use of salvaged materials to construct earth shoulders, approaches, or temporary roadway surfacing or to use in other work the Engineer determines appropriate. Do not salvage foreign or undesirable material. Temporarily stockpile salvaged material outside the limits of Contractor's earth disturbance and within the right-of-way limits, as approved by the Engineer.

Surplus salvaged material is the property of the Contractor. Dispose of surplus salvaged materials in accordance with subsection 205.03.P before project completion.

3. **Disposing of Stones, Broken Rock, and Boulders.** For materials that cannot be incorporated in the work, dispose of the materials in accordance with subsection 205.03.P.

- B. **Rock Excavation.** Excavate boulders with a volume of at least $\frac{1}{2}$ cubic yard. Excavate rock or cemented soils that do not soften when wet or that cannot be removed without continuous drilling, blasting, or continuous use of a ripper or other special equipment.

Expose the surface of the rock to allow the Engineer to measure before starting rock excavation. Remove rock encountered in the excavation to the required cross section and in accordance with all of the following:

1. Excavate so no rock extends more than 6 inches above the lines of the required cross section;
2. Excavate backslopes to the neat line slopes shown on the plans with no rock extending more than 12 inches from the true slope;
3. Excavate the rock surface to provide drainage. Do not leave undrained pockets in the rock surface; and
4. Remove rock or boulders loosened in the excavation and overhanging ledges on or outside the required cross section.

- C. **Peat Excavation.** Remove peat, muck, marl, and very soft underlying clay. Coordinate removal with swamp backfill operations.
- D. **Swamp Backfill.** Construct embankments across peat marshes as shown on the plans. Widen the embankment at culvert locations to provide a stable foundation for the length of the culvert, including headwalls and end sections. Provide granular material Class III for swamp backfill.

If total excavation of peat results in a reasonably dry trench as determined by the Engineer, the Engineer may allow backfilling as a separate operation. Backfill the reasonably dry trench immediately after completing

the excavation in accordance with the controlled density method in subsection 205.03.H.4.a. Perform excavation and backfill as separate operations in shallow peat areas only with the Engineer's prior approval.

Coordinate the rate of advancement of the embankment and surcharge in deep swamps with the rate of excavation of the upheaved peat. If a trench of the required depth is not maintained full width ahead of the surcharge, use additional peat-excavating equipment or stop construction of embankment and surcharge until the two operations are in balance.

Dispose of peat as shown on the plans or in accordance with subsection 205.03.P.

The Department will bore swamp backfill to determine whether unsuitable material has been completely excavated or displaced. If the borings show the presence of unsuitable material under the swamp backfill, the Department will determine the corrective action. The Department will complete borings and notify the Contractor of corrective actions within 60 days after completion of the swamp backfill.

Corrective action may consist of excavating, placing a surcharge, excavating relief trenches, or a combination of these actions.

If a surcharge is placed over the swamp backfill, the Engineer will determine the width and elevation. Leave the surcharge in place until the Engineer determines that the swamp backfill is stable or the required settlement has taken place. The Engineer may require that the surcharge remain in place for up to 90 days.

Material from the surcharge is the property of the Contractor.

Obtain the Engineer's approval for swamp backfill and complete peat excavation and spreading before placing the pavement structure.

- E. **Subgrade Undercutting.** Undercut the subgrade and backfill to replace material susceptible to frost heaving or differential frost action and to remedy unstable soil conditions.

Topsoil removal and peat excavation are not included in subgrade undercutting. Subgrade undercutting includes excavation below subgrade in cut sections, excavation at the transition from cut-to-fill sections, and excavation, other than peat excavation, as required below the topsoil in fill sections.

Excavated material from subgrade undercutting is the property of the Contractor.

1. **Limits of Subgrade Undercutting.** Excavate the subgrade to the approximate grade. The Engineer will promptly inspect the grade to

decide whether undercutting is necessary and to determine the limits of undercutting.

In shallow fill areas, the Engineer will inspect the fill area and determine the limits of the subgrade undercutting before the Contractor begins embankment placement.

Remove deposits of frost heave textured material within the subgrade surface limit. For areas north of the north boundary of Township 12 North, remove the frost heave textured material to a depth of 4 feet to 5 feet below the plan grade. For areas south of the north boundary of Township 12 North, remove the frost heave textured material to a depth of 3½ feet to 4 feet below the plan grade.

2. **Backfill of Subgrade Undercut.** Backfill subgrade undercutting Type I with selected clay or other Engineer-approved material.

Backfill subgrade undercutting Type II with granular material Class II.

Backfill subgrade undercutting Type III with the material excavated from subgrade undercut areas after mixing the excavated material to break up the undesirable strata of soils or with other Engineer-approved backfill material.

Backfill subgrade undercutting Type IV with 21AA dense-graded aggregate or 4G open-graded aggregate. Encapsulate 4G aggregate with geotextile separator.

Compact subgrade undercutting backfill to at least 95% of its maximum unit weight.

- F. **Subgrade Manipulation.** Scarify, mix, and blend the roadbed subgrade to a depth of 12 inches below the top of subgrade. Compact to at least 95% of its maximum unit weight.

- G. **Earth Excavation.** Excavated material is the property of the Contractor.

Compact the subgrade to at least 95% of its maximum unit weight and to a depth of at least 10 inches. If the subgrade cannot be compacted to 95% of its maximum unit weight using conventional construction methods, the Engineer may authorize the use of other methods to attain compaction.

In cut sections where the existing material appears to meet the requirements of subsection 301.02, excavate the grade to top of subbase rather than to the bottom of subbase. The Engineer will then determine whether the existing material meets subbase requirements. Shape material meeting subbase requirements to the top of subbase grade and compact to at least 95% of its maximum unit weight and to a depth of at

least 12 inches. The Engineer will adjust earthwork quantities accordingly. Excavate material not meeting subbase requirements to the bottom of subbase. The Department will not consider claims for damage caused by the Contractor's halting of grading operations so the Engineer can make subbase determinations.

Maintain the roadbed and ditches and provide drainage at all times. Install and remove temporary drainage facilities at no additional cost to the Department.

Perform grading to avoid removing or loosening material outside the required slopes. Replace and compact material removed or loosened outside the slopes to the required density and cross section.

Dispose of surplus or waste material resulting from ditch construction in accordance with subsection 205.03.P. Remove roots, stumps, or other materials that are unacceptable to the Engineer in the slopes and bottom of the ditch and backfill the holes with suitable material. Maintain ditches until the Engineer's final acceptance.

H. Roadway Embankment

1. **Stepping Side Slope.** Step embankments constructed on existing side slopes of 1:6 or steeper before placing embankment. Form steps with a horizontal dimension of at least 3 feet according to the *MDOT Standard Plan R-105* series.
2. **Borrow.** Borrow is defined in subsection 105.03. Excavate, transport, and place borrow material in accordance with subsection 105.03 and the following:

After removal of borrow, leave borrow areas free formed without rigid geometric shapes. Make side slopes as flat as practical but ensure that slopes are no steeper than 1:4. Round the tops and bottoms of slopes with vertical curves to blend into adjacent terrain. Grade overburden left in the borrow area, except topsoil, to eliminate unsightly mounds, as determined by the Engineer.

Where practical, shape borrow areas to drain, leaving usable land after completion. In granular soil, leave the area at least 12 inches above the high ground water level. In cohesive soil, leave the area at least 12 inches above the high-water elevation of the drainage outlet.

If the borrow area cannot be drained, create a pond or a wetland. Create ponds by excavating to a depth of at least 8 feet below normal ground water level in granular soil or to 8 feet below the lowest drainage outlet in cohesive soil. Create wetlands by excavation to the elevation directed by the Engineer.

Restore borrow areas as shown on the plans or in a manner that will leave the land in a useful condition and with a natural appearance. Restore borrow areas within the right-of-way as required by the contract. Fence ponded borrow areas unless otherwise directed by the Engineer.

Restore borrow areas outside the right-of-way in accordance with permit requirements covered by Part 91, Soil Erosion and Sedimentation Control, of the Natural Resources and Environmental Protection Act (Michigan Compiled Laws [MCL] 324.9101 et seq.) and any land use agreements with the property owner.

The Engineer may allow boulders to remain in borrow areas if placement creates a natural appearance.

The Engineer may waive restoration requirements if the Contractor takes borrow from the working area of an existing commercial source or the property owner holds a permit from a county or municipal enforcing agency designated under Part 91, Soil Erosion and Sedimentation Control, of the Natural Resources and Environmental Protection Act (MCL 324.9101 et seq.) Provide the Engineer with a copy of the property owner's permit.

3. **Winter Grading.** The Engineer will determine the winter grading limits. Remove ice and snow from the ground surface before placing embankment.

Remove frozen material if the original ground contains more than 4 inches of frost within the limits of 1:1 slopes extending away from the finished shoulders to points of intersection with the original ground.

Remove frozen material on a partially complete fill before placing more fill on the embankment. Stockpile frozen material in areas approved by the Engineer and outside the limits of earth disturbance until thawed. Use the thawed material in the embankment if it meets moisture requirements at the time of use.

4. **Placing and Compacting Embankment.** After preparing the ground area, construct embankments with sound earth and stones, broken rock, concrete, or masonry, except within the top 3 feet of embankment, or as allowed in the disposal of peat excavation material in accordance with subsection 205.03.D and subsection 205.03.P. Do not place frost heave textured materials in the top 3 feet of embankment below subgrade surface. Use a uniformly textured material to construct the top 3 feet of embankment to a uniformly

stable condition. Provide at least 50 feet of longitudinal transition between two types of textured materials.

Deposit embankment materials and compact in accordance with the controlled density method. The Engineer may direct or approve the 12-inch layer method, rock embankment method, or methods for the treatment of peat marshes.

Construct embankments using methods that do not create an unstable slope condition. Do not block the drainage of granular material by placing impervious material on the outside of embankments or by placing a combination of pervious and impervious material in the embankment, creating potential pockets of saturated material. Do not place peat excavation material in upland areas between the 1:1 slope that extends down from the subgrade surface/front slope intercept point and the final plan fill slope in fills greater than 14 feet high.

The Engineer may allow the placement of uncovered stones within construction limits, broken concrete, and broken rock from rock cuts in embankments. Use stones, broken concrete, and broken rock with the largest dimension no greater than 12 inches. Place in layers. Fill voids with sound earth and compact to at least 95% maximum unit weight. Do not place stones, broken concrete, or broken rock layers within 3 feet of the subgrade surface.

When placing embankment in layers of the required thickness is not feasible (e.g., filling in water, constructing on poorly drained soil), the Engineer may allow construction of the embankment in one layer of granular material Class III and will determine the minimum elevation for equipment operation. Thoroughly compact the fill material. Above the granular material Class III elevation, construct the embankment in accordance with the controlled density method.

Backfill and compact embankment adjacent to structures in accordance with subsections 205.03.I and 206.03.B. Construct other embankment and backfill as follows:

- a. **Controlled Density Method.** Deposit cohesive material for embankments and spread in layers no greater than 9 inches deep, loose measure, and extending the full width of the fill area.

For granular material, attain the required density by depositing, spreading, and compacting in layers no greater than 15 inches deep.

Provide cohesive material with a moisture content no greater than 3% above optimum at the time of compaction. Provide granular material with a moisture content below saturation in accordance

with the one-point cone chart in MDOT's *Density Testing and Inspection Manual*.

Provide cohesive material in the top 3 feet of embankment with a moisture content not exceeding optimum at time of compaction. For material containing excess moisture, dry to the required moisture content before compacting. Ensure that each layer of material meets moisture requirements, and compact each layer to at least 95% of the maximum unit weight before placing the succeeding layer.

If the required percentage of maximum unit weight and the required moisture content are attained but the compacted material does not provide support for the subbase, the Engineer may direct the Contractor to dry the material by aeration and recompact. Aerate by diskings or by manipulating the material using other methods approved by the Engineer.

- b. **Twelve-Inch Layer Method.** Deposit the material and spread in layers no greater than 12 inches deep, loose measure, parallel to the finished grade, and extending to the full width of the embankment. Deposit the material by operating the hauling equipment over the layer being placed. Compact each layer to at least 95% of its maximum unit weight in accordance with the 12-inch layer method test in MDOT's *Density Testing and Inspection Manual*.

- c. **Rock Embankment**

Use shattered rock from blasting or ripping with the largest dimension no greater than 12 inches to construct rock embankment. Deposit rock on the constructed fill and push over the leading edge to extend the fill. Do not deposit the shattered rock from the hauling equipment directly over the end of the fill. Place the rock embankment in layers no greater than 3 feet thick. Fill the surface of the rock embankment with rock fragments and rock fines to prevent infiltration of the earth embankment. Use granular material Class III to supplement insufficient rock fines to fill the surface of the rock embankment.

Do not use the aforementioned method in fills less than 4 feet deep. Do not place the stones and broken rock layers within 3 feet of the subgrade surface. For structures under rock embankment, provide at least 24 inches of granular material Class III along the sides and the top of structures before placing the rock embankment.

I. Structure Embankment

1. **Compaction of Original Ground.** In fill areas on which a structure is required, remove the topsoil from the area within the toes of slope in accordance with subsection 205.03.A.1. Compact the area to at least 95% of the maximum unit weight and at least 9 inches deep.
 2. **Placing Structure Embankment.** Place and compact structure embankment to the limits shown on the plans before casting overlying footings. Protect structure embankments from freezing until placement of overlying footings.
 - a. **Under Structure Footings Supported by Piling.** Construct structure embankment with Class III granular material within the limits shown on the plans. The Engineer may allow the use of sound earth as an alternate material when placed between April 1 and November 15. Use sound earth as defined in subsection 205.01 except that for rocks, the greatest dimension must be less than 3 inches. Deposit and compact structure embankment in accordance with the controlled density method.
 - b. **Under Structure Footings for Which Piling is Not Specified.** Construct structure embankment with Class III granular material within the limits shown on the plans and deposit and compact in accordance with the controlled density method. Compact structure embankment to 100% of the maximum unit weight within the limits of 1:1 slopes, extending outward and downward from the bottom edges of the structure footings.
 3. **Winter Grading for Structure Embankment.** Construct embankment during winter weather in accordance with subsection 205.03.H.3 except that before placing embankment to support a structure, remove ground containing frost within the limits of 1:1 slopes spreading outward in every direction from the bottom edges of structure footings. Stockpile frozen material until thawed outside the limits of earth disturbance in areas that are approved by the Engineer.
- J. Machine Grading.** Machine grading consists of light grading, 12 inches deep, to develop the cross section shown on the plans and includes the following:
1. Scarifying;
 2. Plowing;
 3. Disking;
 4. Moving;

5. Compacting; and
6. Shaping the earth.

Loading or hauling material is not required for machine grading.

Grade ditches to drain runoff water. Grade intersections, approaches, entrances, and driveways as shown on the plans or as directed by the Engineer. Obtain the Engineer's approval before using excavation from ditches and roadbeds for shaping shoulders and adjacent fills.

- K. **Ditch Cleanout.** Perform ditch cleanout to a depth of no greater than 2 feet based on a typical cross section shown on the plans. Include the following work:
 1. Remove cattails, brush, and miscellaneous debris;
 2. Remove trees with a diameter of less than 6 inches;
 3. Blend ditch profiles to match the existing ditch; and
 4. Remove soils/spoils from the project site.
- L. **Temporary Railroad Crossing.** Construct temporary railroad crossings in accordance with subsection 107.20.
- M. **Granular Blanket.** Excavate unstable soil in the slopes and backfill within the limits and to the depths shown on the plans or as directed by the Engineer. Dispose of excavated material in accordance with subsection 205.03.P.

For granular blanket, Type 1, backfill with granular material Class II.

For granular blanket, Type 2, dress the excavated area with a nominal 3-inch layer of granular material Class II before placing the drainage layer. Construct the drainage layer using one of the following:

1. A 2-inch layer of open-graded aggregate with geotextile blanket above and below;
2. A three-dimensional mesh with geotextile blanket above and below; or
3. Other geocomposite section approved by the Engineer.

Place at least a 12-inch layer of granular material Class II on the drainage layer to bring the slope and ditch section to the required elevation and cross section.

Construct underdrains adjacent to or as a part of the slope protection in accordance with section 404.

- N. **Trimming and Finishing Earth Grade.** Construct the earth grade to the required grade. Remove exposed stones and rocks with a diameter greater than 3 inches.

Trim the subgrade to the grade shown on the plans. If a subbase is required, trim the subgrade to within 1 inch of the required grade. If a subbase is not required, trim the subgrade to within $\frac{3}{4}$ inch of the required grade.

Trim and shape the earth grade outside the subgrade to the required lines, grades, and cross sections. Finish slopes to Class B tolerance unless Class A tolerance is required.

Finish Class A slopes to within 1 inch of the average slopes shown on the plans. Make measurements at right angles to the slope.

Finish Class B backslopes to within 6 inches of the average slopes shown on the plans. Make measurement at right angles to the slope. Do not leave abrupt variations in the finished surface. Remove debris and unsuitable material.

Finish Class B fill slopes to within $2\frac{1}{2}$ inches of the required grade and cross section from the outside shoulder line for 3 feet down the slope. Measure at right angles to the slope. Finish the remainder of the fill slope the same as a Class B backslope.

If trees or other obstacles do not interfere, round the tops of backslopes, bottoms of fill slopes, and other angles in the lines of the cross section to form vertical curves as shown on the plans or as directed by the Engineer. Make vertical curve transitions gradual such that they present a uniform and attractive appearance. The Contractor may omit vertical curves if constructing ditches in peat.

- O. **Channel Excavation.** Trim, straighten, widen, deepen, or relocate the channel of a stream or watercourse. Remove and dispose of excavated material. Remove masonry and concrete structures in accordance with section 204. Complete work in the new channel before diverting the stream flow to the new channel. Maintain channels and keep free from debris until final acceptance of the channel.
- P. **Disposing of Surplus and Unsuitable Material.** The Department assumes no legal obligation to ensure that the Contractor responsibly disposes of surplus and unsuitable material in accordance with this section. Permits must be obtained as necessary in accordance with subsection 107.02.
1. **Disposal Within the Right-of-Way.** Do not dispose of material, temporarily or permanently, beyond the normal plan fill slope across

regulated or unregulated wetlands or floodplains. The Engineer may allow disposal of material, including associated restoration material, within the right-of-way to fill low areas or flatten slopes at no additional cost to the Department.

2. **Disposal Outside the Right-of-Way.** Do not dispose of material, temporarily or permanently, in regulated or unregulated wetlands or floodplains. Prior to excavation, obtain written permission from the owner of the property including restoration requirements to be used for disposal outside the right-of-way and file the written permission with the Department. Dispose of material and restore areas in accordance with subsection 205.03.H.2 at no additional cost to the Department.
3. **Contractor Responsibility.** The Contractor is directly and solely responsible for disposal of surplus and unsuitable material.

Contact the appropriate regulatory agencies to determine whether an area is a regulated or unregulated wetland or floodplain before disposing of surplus or unsuitable material in areas outside the right-of-way and not shown on the plans as disposal sites.

Immediately move to an upland site any surplus or unsuitable material that was disposed of in portions of regulated or unregulated wetlands or floodplains not shown on the plans as disposal sites, at no additional cost to the Department. Restore the vacated area as directed by the applicable regulatory agencies at no additional cost to the Department.

The Engineer will not consider requests for extensions of contract time without an assessment of liquidated damages for delays associated with moving surplus or unsuitable material to an upland site.

4. **Notification to Regulatory Agencies.** The Department will notify the applicable regulatory agencies if the Department becomes aware that the Contractor disposed of surplus or unsuitable material in portions of a regulated or unregulated wetland or floodplain not shown on the plans.

- Q. **Berm Grading.** Remove existing earthen berms along shoulders of the roadway including under existing guardrail to facilitate drainage. Remove all berms from the paved shoulder to the hinge point of the fill slope and grade the slope to provide positive drainage or to the dimensions shown on the plans. Removed berm material, if approved for reuse, must be in accordance with subsection 107.15. Dispose of surplus or unsuitable material in accordance with subsection 205.03.P.

205.04. Measurement and Payment

| Pay Item | Pay Unit |
|----------------------------------|-----------------|
| Excavation, Earth..... | Cubic Yard |
| Granular Material, CI ____ | Cubic Yard |
| Excavation, Rock..... | Cubic Yard |
| Excavation, Peat..... | Cubic Yard |
| Backfill, Swamp | Cubic Yard |
| Subgrade Undercutting, Type ____ | Cubic Yard |
| Subgrade Manipulation..... | Square Yard |
| Embankment, LM..... | Cubic Yard |
| Embankment, CIP..... | Cubic Yard |
| Embankment, Structure, CIP..... | Cubic Yard |
| Machine Grading | Station |
| Ditch Cleanout..... | Station |
| Granular Blanket, Type ____ | Cubic Yard |
| Excavation, Channel..... | Cubic Yard |
| Berm Grading | Station |

- A. **Roadway Earthwork Volumes.** Prior to the start of the work, the Engineer and Contractor may agree to accept plan quantity, or the Engineer will calculate roadway earthwork volumes using the average end areas, the staked-section method, or an agreed-to alternative method.

The Engineer will determine the average end areas using the cross sections determined from the original and final elevation measurements. An alternative method such as a comparison of digital terrain models may be used if agreed to by the Contractor and the Engineer prior to the start of work.

For the staked-section method, the Engineer will calculate earthwork quantities by comparing the original cross sections taken before construction to the cross sections taken during and after construction.

The Engineer will take measurements during construction to verify conformance to the required grade and cross sections. The Engineer will adjust quantities for the following:

1. Changes in design;
2. Engineer-authorized deviation from the established grade and cross section;
3. Changes in original ground topography after the original survey was made; or

4. Any changes required by the Engineer during construction such as changing of cut or fill slopes and for excavation of peat, muck, marl, and very soft underlying clay.

- B. **General.** The cost to build, maintain, remove, and restore borrow haul routes is included in the unit prices for other pay items.

The Engineer will measure removed topsoil and other selected excavated materials from embankment areas as **Excavation, Earth**.

If the progress clause in the contract requires the Contractor to construct embankments during the seasonal suspension, the Department will pay for the frozen material that is removed and the embankment that is required to replace it at the unit price for **Excavation, Earth** and **Embankment** of the type required. The Engineer will direct the grading limits during the seasonal suspension.

The Department will not pay for removing topsoil and frozen material to facilitate the Contractor's operations.

The unit prices for other pay items include the cost of compacting existing material in embankment and cut sections after removing topsoil.

The Department will pay for the removal of masonry and concrete structures in accordance with section 204.

The Engineer will measure **Granular Material, CI II** and **Granular Material, CI III** in place. The Engineer will measure **Granular Material, CI III** required for constructing fills in water or constructing fills on poorly drained soil as **Backfill, Swamp**.

The Engineer will measure **Underdrains, Bank** in accordance with subsection 404.04.

The cost of trimming the subgrade and slopes to the required tolerances is included in the unit prices for other pay items.

The cost of restoring borrow and disposal areas is included in the unit prices for other pay items.

- C. **Excavation, Rock.** The Engineer will measure **Excavation, Rock** using the staked-section method with no allowance for overbreak. The Department considers overbreak the material removed outside the area shown on the plans or the Engineer-approved cross section for rock excavation.

The Engineer will not make deductions for rock projecting inside the lines of the cross section within the limits required.

The Engineer will measure boulders greater than $\frac{1}{2}$ cubic yard individually and will calculate the volume from average dimensions taken in three directions. The Department will pay for boulders greater than $\frac{1}{2}$ cubic yard as **Excavation, Rock**.

The Engineer will measure the removal of overburden as **Excavation, Earth**.

- D. **Peat Excavation and Swamp Backfill.** The Engineer will measure total **Excavation, Peat** in its original position.

For the measurement of partial **Excavation, Peat** and displacement, the Engineer will include the volume of the peat that is excavated to form the trench and the excavation of the upheaved peat in the trench. The Engineer will estimate the volume of upheaved peat required for removal from the trench at 100% of the actual peat displaced. The Department will not include peat displaced outside the pay limits shown on the plans in the pay quantity. The Engineer will take borings to determine the depth of displacement for calculating pay quantities.

The Department will pay for excavating peat, muck, marl, and very soft underlying clay as **Excavation, Peat**.

The unit price for **Excavation Peat** includes the cost of rehandling waste material to facilitate displacement.

In the treatment of peat marshes, the Department will not allow claims for delays lasting less than 60 days caused by Department testing and determination of corrective methods. Perform corrective work in areas requiring the total excavation method at no additional cost to the Department.

The Department and the Contractor will share equally the costs for corrective work in areas where the partial peat excavation and displacement method is required or directed by the Engineer. Payment for the corrective work includes excavation and relief trenches. If the Engineer recommends placement of a temporary surcharge, the Department will pay for half the swamp backfill quantity required for the surcharge. The Department will pay for half the quantity of swamp backfill removed as **Excavation, Earth** after the backfill stabilizes or the required settlement occurs.

If shown on the plans, the Department will pay for placement of temporary surcharge at the unit price for **Embankment, CIP or Backfill, Swamp**. The Department will pay for the removal of temporary surcharge at the unit price for **Excavation, Earth**.

The cost of maintaining a temporary surcharge, moved forward as the fill progresses, is included in the unit prices for other relevant pay items.

The Engineer will measure **Backfill, Swamp** in its original position. To facilitate measurement, isolate an area in the borrow pit or roadway cut as the exclusive source of material for **Backfill, Swamp**. If the Engineer requires more than initial and final cross sections to measure and calculate the volume of material removed, the Contractor must pay the Department for additional cross sections and calculations.

If not practical to calculate the volume of **Backfill, Swamp** in its original position, the Engineer will calculate the volume within the limits shown on the plans, or from fill borings, and increase the volume by 15%. The Engineer will not increase the **Backfill, Swamp** volume by 15% if the peat excavation results in a dry hole.

The Engineer will not increase the volume of **Backfill, Swamp** by 15% if the material is used to construct sand core fills regardless of whether sand core fills are shown on the plans or directed by the Engineer.

E. **Subgrade Undercutting and Subgrade Manipulation**

1. **Subgrade Undercutting.** The Engineer will measure **Subgrade Undercutting** in its original position. The Department will not make deductions to subgrade undercut quantities in areas where underdrain is installed.

The Department will not adjust the unit price for changes to the quantity of the type of **Subgrade Undercutting** required.

The unit price for **Subgrade Undercutting** of the type required includes the cost of removal and disposal of unsuitable material and replacement with required material.

Payment for geotextile separator required for 4G backfill will be paid for according to subsection 308.04.

2. **Subgrade Manipulation.** The Engineer will measure **Subgrade Manipulation** only in designated areas shown on the plans or directed by the Engineer.

F. **Earth Excavation and Embankment.** The cost of stepping side slopes is included in the unit prices for the related roadway embankment pay items.

1. **Embankment, LM.** The Engineer will measure **Embankment, LM** by volume, loose measure. The unit price for **Embankment, LM** includes the cost of providing, hauling, placing, and compacting material at the required locations.

2. **Excavation, Earth and Embankment, CIP.** Payment for **Excavation, Earth and Embankment, CIP** will be based on subsection 205.04.A.

If material is removed in embankment areas to a greater depth than required, the Department will pay only for the quantities of **Excavation, Earth; Embankment, CIP; and Embankment, Structure, CIP** as shown on the plans or as directed by the Engineer.

3. **Embankment, Structure, CIP.** The Engineer will measure **Embankment, Structure, CIP** based on the grade and cross section shown on the plans using the staked-section method. The Engineer will not make allowance for increases in quantities of fill material required due to normal consolidation of the natural ground under the embankment.

The Engineer will measure sound earth if used as structure embankment under pile-supported footings as **Embankment, CIP**.

- G. **Machine Grading.** The Engineer will measure **Machine Grading** along the surface edge. The Engineer will measure each side of the road where work is performed, separately.
- H. **Ditch Cleanout.** The Engineer will measure **Ditch Cleanout** along the center line of the ditch. Restoration will be paid for separately in accordance with section 816.
- I. **Granular Blanket**
 1. **Granular Blanket, Type 1.** The Engineer will measure **Granular Blanket, Type 1**, including the volume of granular material Class II, within the limits and to the depth shown on the plans or as approved by the Engineer.
 2. **Granular Blanket, Type 2.** The Engineer will measure **Granular Blanket, Type 2** in place and include the volumes of the drainage layer and granular material Class II within the limits and to the depth shown on the plans or as approved by the Engineer.
- J. **Channel Excavation.** The Engineer will measure **Excavation, Channel** by volume in its original position.
- K. **Berm Grading.** The Engineer will measure **Berm Grading** along the shoulder edge. The Engineer will measure each side of the road where work is performed, separately. The cost for berm grading under guardrail is included in this item. Grading under new or reconstructed guardrail is included in the unit price for the guardrail according to subsection 807.04.A.

Section 206. Excavation and Backfill for Structures

206.01. Description

This work consists of clearing, removing old structures or parts of structures, removing materials required for constructing structures, disposing of surplus or unsuitable material in accordance with subsection 205.03.P, and backfilling completed structures.

206.02. Materials

Provide materials in accordance with the following sections:

| | |
|----------------------------------|-----|
| Sound Earth | 205 |
| Granular Material Class II | 902 |
| Aggregate, 6A | 902 |
| Geosynthetics | 910 |

- A. **Bridges, Pump Stations, Retaining Walls, and Culverts (Other Than Pipe).** Provide granular material Class II.
- B. **Miscellaneous Structures.** Unless otherwise required, provide sound earth. Miscellaneous structures are structures other than bridges, pump stations, retaining walls, and culverts other than pipe.

206.03. Construction

- A. **Foundation Excavation and Rock Foundation Excavation.** Excavate to allow for foundation unit construction. If shown on the plans or approved by the Engineer, trim the footing excavation to the exact size of the footing and omit the footing forms. For concrete placed on or against an excavated surface other than rock, do not disturb the bottom and side surfaces of the excavation before placing concrete. Excavate to the required grade immediately before concrete placement.

Before placing concrete, check the excavation depth and secure the Engineer's approval of the foundation support material. Place concrete in the absence of free-standing water. Change the elevations for the bottom of footings as directed by the Engineer to ensure a stable foundation.

If directed by the Engineer, remove and replace unsound material under proposed structures and replace with Department-approved material. Remove loose fragments and clean and cut rock surface or other hard material before placing concrete on required surface. Level, step, or serrate the surface as directed by the Engineer.

1. **Foundation Excavation.** Excavate materials, including portions of the existing structures, within the foundation excavation limits, except rock foundation excavation.
 2. **Rock Foundation Excavation.** Excavate in accordance with subsection 205.03.B.
- B. **Backfill Placement and Compaction.** Place and compact backfill around completed structures.
1. **Placing Backfill.** Provide material appropriate for the type of structure requiring backfill in accordance with subsection 206.02.

If soil that is excavated from the site meets material requirements, the Contractor may use it to backfill around completed structures.

Place backfill against the concrete structure after completion of the required curing, surface finishing, and waterproofing. Cover the inlet of each weep hole with geotextile blanket prior to placing backfill. Place backfill evenly around the structure to equalize horizontal loadings.

2. **Compacting Backfill**

- a. **Bridges, Pump Stations, Retaining Walls, and Culverts (Other Than Pipe).** Place backfill material in 6-inch layers. Compact each layer to 100% of the maximum unit weight in the load-bearing area. The load-bearing area is the area within the 1:1 slope, down and away from the outer limits of the bottom of the footing to the bottom of the excavation.

Place backfill behind and around substructure units, between the outer limits of the bottom of the footing and the surface elevation, in layers no greater than 12 inches deep. Compact backfill to at least 95% of the maximum unit weight.

Place backfill between the bottom of footing elevation and the bottom of slope paving subbase in layers no greater than 12 inches deep. Compact to at least 95% of the maximum unit weight.

- b. **Miscellaneous Structures.** For miscellaneous structures, place backfill in 12-inch layers and compact to at least 95% of the maximum unit weight. The Engineer may approve an increase in the thickness of layers if the Contractor obtains the required compaction results.

206.04. Measurement and Payment

| Pay Item | Pay Unit |
|-------------------------------|-----------------|
| Excavation, Fdn..... | Cubic Yard |
| Excavation, Rock Fdn..... | Cubic Yard |
| Backfill, Structure, CIP..... | Cubic Yard |
| Backfill, Structure, LM..... | Cubic Yard |
| Aggregate, 6A | Cubic Yard |

- A. **Excavation.** The Department does not consider excavation to include removal of ice, water, or liquids. Unless otherwise required, the cost of sheeting, shoring, and dewatering is included in the unit prices for related structure excavation pay items.

1. **Excavation, Foundation.** The Engineer will base payment for **Excavation, Fdn** on plan quantity in accordance with subsection 109.01.A. Unless otherwise shown on the plans, the Engineer will determine the plan quantities using the space bounded by the existing ground surface or exposed portions of the existing substructure, the elevation of the bottom of the foundation, and the 1:1 slopes extending outward and upward from points 18 inches outside the bottom of the footing.

The Department will pay for, as extra work, the removal of piling below the bottom of footing elevations that is not shown on the plans and encountered during structure excavation.

2. **Excavation, Rock Foundation.** The Engineer will measure **Excavation, Rock Fdn** in its original position for the amount of rock excavated within vertical planes through the footing neat lines. The Engineer will make allowance for overbreak if the Engineer determines that it is impractical to excavate to the neat lines of the footing. The Engineer will measure the amount of overbreak by actual cross sections of the footing excavation. Overbreak allowance is limited to vertical planes 6 inches outside and parallel to the neat lines of the footing and to a depth of 3 inches below the elevation of the bottom of the footing, as shown on the plans.

Excavation, Rock Fdn does not include removal of portions of existing structures.

B. Backfill

1. **Backfill, Structure, CIP.** The Engineer will base payment for **Backfill, Structure, CIP** on plan quantity in accordance with subsection 109.01.A regardless of the foundation excavation slope. The Engineer

will not measure material placed outside the maximum pay limits shown on the plans.

The Department will pay for granular material Class II used to backfill bridges, pump stations, retaining walls, and culverts other than pipe as **Backfill, Structure, CIP**.

2. **Sound Earth**. The cost of sound earth used as backfill material for miscellaneous structures is included in the unit prices for related pay items.
3. **Aggregate, 6A**. The Engineer will measure **Aggregate, 6A** by volume, loose measure. The unit price for **Aggregate, 6A** includes the cost of providing, hauling, and placing material at locations as directed by the Engineer.

Section 207. Obliterating Roadway

207.01. Description

This work consists of obliterating existing or temporary roadways as required by the contract. Obliterating roadway applies to the portions of the existing or temporary roadway that are outside the limits of the new roadway.

207.02. Materials

None specified.

207.03. Construction

If an existing or temporary roadway is no longer needed for traffic, remove the HMA or concrete pavement and fill ditches and obliterate the roadway using grading operations. Provide suitable drainage and blend the area with the surrounding ground contours.

Construct natural-appearing obstructions in the old roadway to prevent use by traffic. Break down and bury or remove old structures, in accordance with subsection 204.03. If required, scarify the obliterated roadway to mix aggregate surfacing materials with earth, and leave in a smooth condition.

Topsoil, seed, fertilize, and mulch obliterated areas in accordance with section 816.

If approved by the Engineer, the Contractor may obliterate the roadway by breaking the pavement to provide drainage and covering to at least 12 inches deep using Department-approved material provided by the Contractor.

207.04. Measurement and Payment

| Pay Item | Pay Unit |
|---------------------------|---------------|
| Obliterate Old Road | Station, Acre |

The Engineer will measure **Obliterate Old Road** along the centerline of the roadway requiring obliteration and outside the limits of the new roadway.

The Engineer will measure the removal of HMA surface as **HMA Surface, Rem** or **Pavt, Rem** in accordance with subsection 501.04 or subsection 204.04, respectively, as appropriate. The Engineer will measure the removal of concrete pavement as **Pavt, Rem** in accordance with subsection 204.04.

The Engineer will measure and the Department will pay for seeding, fertilizer, topsoil surface, and mulch in accordance with section 816.

The Department will pay for materials salvaged from the obliterated roadway and used in the construction of the new roadway as approved by the Engineer at the unit prices for the pay items.

Section 208. Soil Erosion and Sedimentation Control

208.01. Description

This work consists of installing and maintaining erosion and sedimentation controls to minimize soil erosion and control sediment from leaving the right-of-way and affecting water resources of the State of Michigan and adjacent properties. Complete this work in accordance with this section and MDOT's *Soil Erosion and Sedimentation Control Manual (SESC Manual)*. The Department considers the terms "stabilization" and "erosion control measures" as defined in the *SESC Manual*.

Failure to install and maintain soil erosion controls may result in project shutdown, fines from the Michigan Department of Environment, Great Lakes, and Energy, or both. The Contractor is responsible for obtaining applicable federal, state, and local permits when disturbing areas outside a Department right-of-way or outside Department-acquired easement areas.

208.02. Materials

Provide materials in accordance with the following sections:

| | |
|---|-----|
| Coarse Aggregate, 6A..... | 902 |
| Granular Material Class II | 902 |
| Dense-Graded Aggregate, 21AA, 22A | 902 |
| Open-Graded Aggregate, 34R | 902 |
| Fencing Materials..... | 907 |
| Culvert Pipe | 909 |
| Geosynthetics | 910 |
| Cobblestone..... | 916 |
| Coarse Aggregate, 3x1 | 916 |
| Riprap | 916 |
| Heavy Riprap | 916 |
| Sand and Stone Bags | 916 |
| Temporary Plastic Sheet | 916 |
| Turbidity Curtain..... | 916 |

208.03. Construction

- A. **Area Limitations.** Conduct work to minimize soil erosion.

Limit the area of earth disturbance to 50 stations of dual roadways or 100 stations of single roadway during clearing and grading. The Engineer may change the limits of exposed surface area based on the Contractor's ability to minimize erosion and prevent offsite sedimentation.

Do not disturb lands and waters outside the limits of earth disturbance within the right-of-way without prior approval from the Engineer. Restore

Contractor-disturbed areas beyond the plan or Engineer-approved limits at no additional cost to the Department.

Obtain and give the Engineer copies of local, state, or federally required permits before disturbing sites outside the right-of-way, such as borrow, waste or disposal areas, haul roads, or storage sites. Provide temporary and permanent erosion and sedimentation controls in accordance with the permits.

- B. **Time Limitations.** Bring grading sections to the final earth grade as soon as possible. Completion of the final earth grade does not include topsoil or other permanent restoration measures. The Engineer will consider the earth grade final and ready for placement of topsoil and permanent soil erosion control measures when the Contractor constructs a slope, channel, ditch, or other disturbed area in accordance with subsection 205.03.N.

Complete topsoil placement and stabilize slopes, channels, ditches, and other disturbed areas within 5 calendar days after final earth grade with permanent soil erosion control measures. Permanently restore and place topsoil on slopes and ditches within 150 feet of lakes, streams, or wetlands within 24 hours of achieving final earth grade using permanent soil erosion control measures.

Do not prolong trimming, finishing final earth grade, or both, to permanently stabilize the project at one time.

- C. **Construction and Maintenance of Erosion and Sedimentation Controls.** Construct temporary or permanent erosion and sedimentation controls in accordance with the *SESC Manual*, details shown on the plans, or as directed by the Engineer.

Maintain temporary erosion and sedimentation controls as necessary to ensure their effectiveness until permanent stabilization of the disturbed area has occurred. Dispose of sediment and debris removed from temporary sedimentation control devices in accordance with subsection 205.03.P.

Maintain permanent erosion controls as necessary to ensure their effectiveness until project completion and acceptance. Repair damaged areas, replace lost devices, and remove sediment as required. Dispose of sediment and debris removed from permanent sedimentation control devices in accordance with subsection 205.03.P.

1. **Check Dams.** Install, maintain, and remove check dams across ditches.

2. **Sediment Traps and Basins.** Excavate 5 cubic yards or less for sediment traps and greater than 5 cubic yards for sediment basins. Construct, maintain, and fill sediment traps and basins.

Prevent the excavated material from eroding into lakes, watercourses, or wetlands. Install required check dams downstream from a trap or basin before excavating the trap or basin.

3. **Filter Bag.** Provide, place, and remove at least 225-square-foot filter bags constructed of geotextile blanket. Pump water from the construction area into the filter bag to filter the water before it enters a watercourse. Install gravel filter berms on the downslope side of the filter bag for additional protection in sensitive areas or where the Engineer determines that the filter bag is not effectively removing the sediment. Place the filter bag in an upland vegetated area, on level ground, above, and as far as possible from watercourse banks. Use one pump discharge hose per filter bag. Hose must be of appropriate size for the filter bag. Use multiple filter bags as necessary to ensure effective filtration. The Engineer must approve the location of the filter bag before pumping begins.

Replace or dispose of the filter bag and its contents when no longer effective or required. Dispose of filter bag and contents in accordance with subsection 205.03.P.

The Contractor may discharge silt-free, sediment-free water directly to a watercourse.

4. **Sand and Stone Bags.** Provide, place, maintain, remove, and dispose of sand or stone bags. Use non-contaminated sediment-free materials. The stone from stone bags may remain in place after the required period if the bags are cut open and the stone spread evenly, as directed by the Engineer.
5. **Silt Fence.** Provide, install, maintain, remove, and dispose of silt fence consisting of woven geotextile fabric stapled to and supported by posts. Place material removed from trenching in the silt fence on the upslope side of the silt fence. In areas where water ponds behind the silt fence, provide a stone filter to channel away the water and prevent failure. Silt fence may remain in place after the required period if directed by the Engineer.
6. **Gravel Filter Berm.** Provide, place, maintain, remove, and dispose of gravel filter berms consisting of coarse aggregate 6A or open-graded aggregate 34R. Do not use a gravel filter berm instead of a check dam in a ditch.

7. **Inlet Protection, Fabric Drop.** Provide, place, maintain, and remove fabric drop inlet protection devices as directed by the Engineer. Remove and dispose of accumulated sediment as necessary.
 8. **Inlet Protection, Geotextile and Stone.** Provide, place, maintain, remove, and dispose of geotextile blanket, coarse aggregate 6A or open-graded aggregate 34R or both, for inlet protection. Remove and dispose of accumulated sediment as necessary.
 9. **Inlet Protection, Sediment Trap.** Excavate, provide, maintain, remove, and dispose of sediment traps consisting of geotextile blanket and coarse aggregate 6A or open-graded aggregate 34R. Remove and dispose of accumulated sediment as necessary.
 10. **Temporary Plastic Sheets or Geotextile Cover.** Provide, place, maintain, remove, and dispose of plastic sheets or geotextile cover. Secure temporary plastic sheets or geotextile cover as directed by the Engineer.
 11. **Sand Fence.** Provide, maintain, remove, and dispose of fence to prevent sand from migrating onto roads.
 12. **Aggregate Cover.** Provide, place, maintain, remove, and dispose of geotextile separator and dense-graded aggregate 21AA, coarse aggregate 3x1, coarse aggregate 6A, or other Engineer-approved material.
 13. **Gravel Access Approach.** Provide, place, maintain, remove, and dispose of geotextile separator and coarse aggregate 3x1 or other Engineer-approved material.
 14. **Turbidity Curtain.** Provide, install, maintain, remove, and dispose of shallow or deep turbidity curtain.

Use shallow turbidity curtain when the water is no greater than 2 feet deep. Use deep turbidity curtain when the water is greater than 2 feet deep.

Provide a floating or staked turbidity curtain. During removal, minimize sediment loss.
 15. **Intercepting Ditch.** Construct and maintain intercepting ditches. Remove ditches when no longer needed or as directed by the Engineer.
- D. **Removal of Erosion and Sedimentation Control Facilities.** Remove or obliterate temporary erosion and sedimentation controls when the permanent controls are complete and approved unless otherwise directed by the Engineer. Do not remove temporary controls next to lakes,

watercourses, or wetlands until the establishment of turf on the adjacent slopes. Before placing topsoil, permanent seed, and fertilizer, remove or incorporate mulch placed for temporary erosion control into the slope. Minimize erosion and sedimentation into watercourses during removal of erosion controls. Repair damage caused during the removal of erosion controls at no additional cost to the Department.

208.04. Measurement and Payment

| Pay Item | Pay Unit |
|---|-------------|
| Erosion Control, Check Dam, Stone | Foot |
| Erosion Control, Sediment Trap | Each |
| Erosion Control, Sediment Basin | Cubic Yard |
| Erosion Control, Filter Bag | Each |
| Erosion Control, Sand Bag | Each |
| Erosion Control, Stone Bag | Each |
| Erosion Control, Silt Fence | Foot |
| Erosion Control, Gravel Filter Berm | Foot |
| Erosion Control, Inlet Protection, Fabric Drop | Each |
| Erosion Control, Inlet Protection, Geotextile and Stone | Each |
| Erosion Control, Inlet Protection, Sediment Trap | Each |
| Erosion Control, Temp Plastic Sheet/Geotextile Cover | Square Yard |
| Erosion Control, Sand Fence | Foot |
| Erosion Control, Aggregate Cover | Square Yard |
| Erosion Control, Gravel Access Approach | Each |
| Erosion Control, Maintenance, Sediment Rem | Cubic Yard |
| Erosion Control, Turbidity Curtain, Shallow | Foot |
| Erosion Control, Turbidity Curtain, Deep | Foot |
| Ditch, Intercepting | Station |

The Department will not pay for repairing or replacing temporary or permanent SESC measures damaged by the Contractor's negligence. The Department will pay for repairing or replacing temporary or permanent SESC measures damaged by causes other than the Contractor's negligence at the contract unit price for the relevant pay items.

- A. **Erosion Control, Check Dam, Stone.** The Engineer will measure **Erosion Control, Check Dam, Stone** in place. The unit price for **Erosion Control, Check Dam, Stone** includes the cost of providing, placing, maintaining, and removing the stone check dam.
- B. **Erosion Control, Sediment Trap or Basin**
 1. Erosion Control, Sediment Trap. The unit price for **Erosion Control, Sediment Trap** includes the cost of excavating, constructing, maintaining, and removing sediment traps.

The Department will pay separately for removing and disposing of accumulated sediment or debris from a sediment trap as **Erosion Control, Maintenance, Sediment Rem.**

2. **Erosion Control, Sediment Basin.** The Engineer will measure **Erosion Control, Sediment Basin** by volume, loose measure. The unit price for **Erosion Control, Sediment Basin** includes the cost of excavating, constructing, maintaining, and removing the sediment basin.

The Department will pay separately for removing and disposing of accumulated sediment or debris from a sediment basin as **Erosion Control, Maintenance, Sediment Rem.**

- C. **Erosion Control, Filter Bag.** The unit price for **Erosion Control, Filter Bag** includes the cost of providing, placing, maintaining, and disposing of the filter bag and its contents and restoring the filter bag site.

The Department will pay separately for gravel filter berm used in conjunction with a filter bag as **Erosion Control, Gravel Filter Berm.**

- D. **Erosion Control, Sand Bag and Erosion Control, Stone Bag.** The Engineer will measure **Erosion Control, Sand Bag** and **Erosion Control, Stone Bag** in place. The unit prices for **Erosion Control, Sand Bag** and **Erosion Control, Stone Bag** include the cost of providing, placing, maintaining, removing, and disposing of the sand or stone bags.

- E. **Erosion Control, Silt Fence.** The Engineer will measure **Erosion Control, Silt Fence** in place excluding overlaps. The unit price for **Erosion Control, Silt Fence** includes the cost of providing, installing, maintaining, removing, and disposing of the fence and posts.

The Department will pay separately for removing and disposing of accumulated sediment or debris from behind silt fence as **Erosion Control, Maintenance, Sediment Rem.**

- F. **Erosion Control, Gravel Filter Berm.** The Engineer will measure **Erosion Control, Gravel Filter Berm** in place. The unit price for **Erosion Control, Gravel Filter Berm** includes the cost of providing, placing, maintaining, removing, and disposing of the gravel filter berm.

- G. **Erosion Control, Inlet Protection**

1. **Erosion Control, Inlet Protection, Fabric Drop.** The unit price for **Erosion Control, Inlet Protection, Fabric Drop** includes the cost of constructing, maintaining, and removing inlet protection fabric drops.
2. **Erosion Control, Inlet Protection, Geotextile and Stone.** The unit price for **Erosion Control, Inlet Protection, Geotextile and Stone**

includes the cost of constructing, maintaining, and removing geotextile and stone inlet protection.

3. **Erosion Control, Inlet Protection, Sediment Trap.** The unit price for **Erosion Control, Inlet Protection, Sediment Trap** includes the cost of excavating, constructing, maintaining, and removing sediment traps for inlet protection.

The Department will pay separately for removing and disposing of accumulated sediment or debris from a sediment trap inlet protection device as **Erosion Control, Maintenance, Sediment Rem.**

- H. **Erosion Control, Temporary Plastic Sheet/Geotextile Cover.** The unit price for **Erosion Control, Temporary Plastic Sheet/Geotextile Cover** includes the cost of constructing, maintaining, and removing temporary plastic sheets and geotextile covers.
- I. **Erosion Control, Sand Fence.** The Engineer will measure **Erosion Control, Sand Fence** in place. The unit price for **Erosion Control, Sand Fence** includes the cost of constructing, maintaining, and removing sand fence.
- J. **Erosion Control, Aggregate Cover.** The unit price for **Erosion Control, Aggregate Cover** includes the cost of constructing, maintaining, and removing aggregate cover.
- K. **Erosion Control, Gravel Access Approach.** The unit price for **Erosion Control, Gravel Access Approach** includes the cost of temporary culverts and ditching required to maintain existing drainage courses through or around gravel access approaches and providing, constructing, maintaining, and removing gravel access approaches.
- L. **Erosion Control, Maintenance, Sediment Rem.** The Engineer will measure **Erosion Control, Maintenance, Sediment Rem** by volume, loose measure. The unit price for **Erosion Control, Maintenance, Sediment Rem** includes the cost of removing sediment and debris from erosion and sedimentation control devices as required by the *SESC Manual* and as necessary to ensure their effectiveness.
- M. **Erosion Control, Turbidity Curtain.** The Engineer will measure **Erosion Control, Turbidity Curtain, Shallow** and **Erosion Control, Turbidity Curtain, Deep** in place. The unit prices for **Erosion Control, Turbidity Curtain, Shallow** and **Erosion Control Turbidity Curtain, Deep** include the cost of providing, installing, maintaining, and removing turbidity curtains.

The unit price for **Erosion Control, Maintenance, Sediment Rem** includes the cost of removing and disposing of accumulated sediment or debris retained by the turbidity curtain.

- N. **Intercepting Ditch.** The Engineer will measure **Ditch, Intercepting** in place along the ditch centerline. The unit price for **Ditch, Intercepting** includes the cost of constructing, maintaining, and removing the intercepting ditch.

Section 209. Project Cleanup

209.01. Description

This work consists of removing and disposing of debris including fences, fallen timber, logs, guardrail sections and posts, rocks, boulders, and other rubbish from the Contractor's operations within the project limits in accordance with section 201 and section 205.

209.02. Materials

None specified.

209.03. Construction

Provide project cleanup as an ongoing operation. Perform project cleanup within the right-of-way but over an area no greater than 50 feet beyond the limits of earth disturbance for the length of the project.

Fill holes and ruts resulting from construction operations with Department-approved material. Compact and level filler materials and restore ruts and holes to the surrounding contour in accordance with section 816 or as directed by the Engineer.

Clean existing culverts, sewers, or drainage structures that contain sediment or debris from the construction operation.

209.04. Measurement and Payment

| Pay Item | Pay Unit |
|-----------------------|----------|
| Project Cleanup | Lump Sum |

The Department will pay for **Project Cleanup** upon completion of the cleanup operation. If the contract does not include a pay item for **Project Cleanup**, the Department will consider the cost of this work to be included in the contract unit prices for other relevant pay items.